

RENÉ J. DUBOS, *The professor, the Institute, and DNA. Oswald T. Avery. His life and scientific achievements.* New York: The Rockefeller University Press, 1976. 262 pp. \$14.50.

The family of Oswald T. Avery (1877-1955) were Baptists who came to Nova Scotia from Norfolk four years before his birth. His father was a minister first in Halifax and then at the Mariners' Temple in a poor and vice-ridden part of New York City. In 1890 their house in Henry Street was burnt down. In 1892 Avery's father and his elder brother died. From an early age Avery contributed to the support of his mother and his younger brother, Roy. He was destined, it appears, to follow in his father's footsteps; but the liberal environment of Colgate Academy, followed by Colgate University, loosened the hold of fundamentalist Christianity upon him, and he turned from his arts-based education to sciences entering the College of Physicians and Surgeons in 1900 and leaving with an M.D. four years later. The author traces Avery's subsequent career from general practice, private laboratory research, through to his long association with the Rockefeller Institute Hospital.

The author's aim has been to explain what was special about the climate of the Rockefeller in Avery's time, and what was special about Avery. Dubos clearly sees the contribution of Avery and other Rockefeller scientists as crucial to the development of our knowledge of DNA and molecular biology. He shows that these contributions were based upon the hard-line reductionist stance of Jacques Loeb married to the high standard of chemical research achieved by such members of the institute as Heidelberg, Levene and McCarty. Dubos contrasts this approach with the 'flamboyant theoretical declarations of the "phage group"', who seemed 'more concerned with cosmic riddles than with living organisms'. It is the exact opposite to Max Delbrück's oft-repeated scorn for chemistry in biology, a point of view which Delbrück still expressed as late as 1949.¹ From an historiographical point of view Dubos's book may help to undermine some mythical elements in the retrospective validation of the role played by those physicists who came into biology preaching Niels Bohr's sermon against orthodox physico-chemical reductionism in biology. His account is based upon his own recollections of life at the Rockefeller and his association with Avery. He has drawn upon manuscripts preserved by Roy Avery's wife and by the Tennessee State Library and Archives in Nashville, and upon Avery's reports to the Board of Scientific Directors of the Rockefeller Institute. Also included are extracts from John D. Rockefeller's correspondence with Avery's father preserved in the Rockefeller Family Archives. With these scattered sources Dubos has been able to fill in many details of the early life of this scientist. He brings out the remarkable contrast between the extroverted young cornet player at the Mariners' Temple and Colgate University, the enthusiastic evangelist and successful public orator, and the later introverted Avery, reserved, retiring, reluctant to address scientific gatherings and attend scientific meetings—he would not even go to London to receive the Royal Society's prestigious award of the Copley Medal.

Avery's lifework centered around host-pathogen relationships which he sought to describe in chemical terms. His major successes were in identifying the specific soluble substance of pneumococcus as a polysaccharide and the transforming principle of pneumococcus as DNA. The intriguing relationship between Avery's early ideas on virulence and Almroth Wright's opsonin theory deserves fuller treatment. Dubos's account of Avery's theories of antigenic dissociation and antiblastic immunity gives evidence that unsuccessful work has not been excluded to serve the ends of hagiography. At the same time the reader may well be irritated by what seem like mere speculative reconstructions and special pleadings by which Dubos attempts a rational reconstruction of Avery's behaviour. The author's obsession with this aim has caused a considerable amount of repetitious argumentation.

The book includes a useful set of chronologies, an all too brief extract from Avery's report on antigenic dissociation, and the famous portion of Avery's letter

¹ M. Delbrück, 'A physicist looks at biology', *Transactions of the Connecticut Academy of Sciences*, 38 (1949), 173-190; reprinted in J. Cairns and others (eds.), *Phage and the origins of molecular biology* (1966, Cold Spring Harbor).

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to his brother on bacterial transformation. As a contribution to the history of twentieth-century science this book will undoubtedly play a role. It should stimulate interest in the history of the Rockefeller Institute.² It also offers a counterweight to the current emphasis upon the importance of the intellectual migration of physicists into biology for the development of molecular biology.

² Despite the excellent account by George Corner in *A history of the Rockefeller Institute 1901-1953* (1964, New York), the sources, character and successes of the reductionist ethos at the Rockefeller Institute deserve the attention of scholars.

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